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EXAMINER	
JOHNSON, BRIAN P	
ART UNIT	**PAPER NUMBER**
2183	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/05/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/689,380	BEAUMONT, MARK	
	Examiner	Art Unit	
	Brian P. Johnson	2183	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *03 November 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-26 are pending.

Papers Filed

2. Examiner acknowledges receipt of amendment and remarks filed on 03 November 2006.

Drawings

3. Objections to the drawings have been withdrawn.

Claim Objections

Claim objections have been withdrawn.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-26 are rejected under 35 U.S.C. 101 because they lack a tangible result.

The claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02.

The tangible requirement does not necessarily mean that a claim must either be tied to a particular machine or apparatus or must operate to change articles or materials to a different state or thing. However, the tangible requirement does require that the claim must recite more than a Sec. 101 judicial exception, in that the process claim must set forth a practical application of that Sec. 101 judicial exception to produce a real-world result. Benson, 409 U.S. at 71-72, 175 USPQ at 676-77 (invention ineligible because had "no substantial practical application."). "[A]n application of a law of nature or mathematical formula to a . . . process may well be deserving of patent protection." Diehr, 450 U.S. at 187, 209 USPQ at 8 (emphasis added); see also Corning, 56 U.S. (15 How.) at 268, 14 L.Ed. 683 ("It is for the discovery or invention of some practical method or means of producing a beneficial result or effect, that a patent is granted . . ."). In other words, the opposite meaning of "tangible" is "abstract."

In particular, the independent claims have a final result of "selecting." This is not a tangible result in that it does not result in a physical transformation of the processing system. The dependant claims fail to rectify this deficiency. Examiner suggests amending the claims to include such a result. This may be done by storing as a result of the selecting to require a change in a register or memory.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1-2, 5-11, 15-16, and 19-26 are rejected under 35 U.S.C. 102(b) as being anticipated by Taylor (U.S. Patent No. 4,992,933).

As per claim 1, Taylor teaches a method of controlling a plurality of processing elements, comprising: at least certain of said processing elements (Fig. 1 array controller 14) maintaining a count, each count being responsive to a processing element's location; selecting data in each processing element maintaining a count, for output in response to that processing element's count (col 4 line 67 to col 5 line 28).

6. As per claim 2, Taylor teaches the method of claim 1 wherein said maintaining a count includes setting a counter to a first known value and altering the count at programmable intervals by a programmable amount, said storing occurring when a current count equals a target value. *The examiner asserts that in order to maintain a count, it must inherently be set to an initial value. Further, the examiner asserts that updating said count is inherent, as a count is useless unless it is updated on each iteration of the function it is counting. Data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

7. As per claim 5, Taylor teaches a method of controlling the data selected as output data by a plurality of processing elements, comprising:

issuing an instruction set to said plurality of processing elements, said instruction set being performed through a series of data shifts; (Col. 2 lines 42-48)

maintaining a count responsive to said data shifts within at least certain of said processing elements; *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

and selecting data based on said counts. *The examiner asserts that data is selected when the final shift has occurred.*

8. As per claim 6, Taylor teaches the method of claim 5 wherein said instruction set includes one of an edge shift, planer shift, wrap shift and vector shift or a combination thereof. *Figure 7b discloses a wrap shift.*

9. As per claim 7, Taylor teaches the method of claim 5 wherein said data shifts include shifting data in one of a north, south, east and west, plus z and minus z directions. *Figure 7b discloses shifting in the west direction.*

10. As per claim 8, Taylor teaches a method of controlling the position of data in a plurality of processing elements, comprising:

shifting data within the plurality of processing elements along one of a row, column or diagonal; *The examiner asserts that data is shifted along rows in fig. 7b.*

and each active processing element selecting data as a final output in response to that processing element's location within the plurality of processing elements. *The examiner asserts that final data is selected after the final shift has occurred. Each element maintains the data it has just received, based on its location in the array.*

11. As per claim 9, Taylor teaches the method of claim 8 additionally comprising loading an initial count into at least certain of said plurality of processing elements and calculating an initial count locally based on the processing element's location in the plurality and the function being performed on the data. *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue 1+n/2 shift instructions (col. 10 line 18).*

12. As per claim 10, Taylor teaches the method of claim 9 additionally comprising maintaining a current count in at least certain of said plurality of processing elements, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that a current count is inherent to the loop control of Taylor's system. If a count were never updated on each iteration of the loop, the count would never increment or decrement, and the loop would never exit. The examiner further asserts that data is*

stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.

13. As per claim 11, Taylor teaches the method of claim 10 wherein said initial count is modified by a programmable amount at programmable intervals to produce said current count. *The examiner asserts that Taylor's system is programmed to operate as disclosed. It is inherent that the count is programmed to update as per the requirements of the system.*

14. As per claim 15, Taylor teaches the method of claim 8 wherein said shifting includes shifting data north to south, south to north, east to west, west to east, northeast to southwest, southwest to northeast, northwest to southeast and southeast to northwest. *The examiner asserts that all these shift directions take place in the shift mapped in Fig. 7a. Diagonal shifts are accomplished by means of two shifts consisting of a vertical and a horizontal shift.*

15. As per claim 16, Taylor teaches a method for controlling the position of data in a matrix of processing elements, comprising:

shifting data within the matrix of processing elements; *Fig. 7a and 7b illustrate shifting data in the matrix.*

maintaining a current count in each active processing element responsive to the number of data shifts; *The examiner asserts that the array controller 14 constitutes a*

processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue 1+n/2 shift instructions (col. 10 line 18). The examiner asserts that the array controller constitutes an active processing element, as it keeps track of the count data for the entire array.

and selecting output data as a function of said current count. *The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

16. As per claim 19, Taylor teaches the method of claim 16 wherein said shifting includes the north to south and south to north shifting of columns, the east to west and west to east shifting of rows, and the northeast to southwest, southwest to northeast, northwest to southeast and southeast to northwest shifting of diagonals. *The examiner asserts that all these shift directions take place in the shift mapped in Fig. 7a. Diagonal shifts are accomplished by means of two shifts consisting of a vertical and a horizontal shift.*

17. As per claim 20, Taylor teaches a method, comprising: shifting data within a plurality of processing elements; and each active processing element selecting data as a final output in accordance with the formula f(x_Index, y_Index, z_Index) where f is dependent upon the desired output. *The examiner asserts that the shifts outlined in*

Fig. 7a and 7b constitute data being shifted within a plurality of processing elements. The examiner further asserts that data is stored in response to the elements' locations: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift, dependent on their location in the shift scheme.

18. As per claim 21, Taylor teaches the method of claim 20 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location and the function f. *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

19. As per claim 22, Taylor teaches the method of claim 21 additionally comprising maintaining a current count in each processing element, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that a current count is inherent to the loop control of Taylor's system. If a count were never updated on each iteration of the loop, the count would never increment or decrement, and the loop would never exit. The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

20. As per claim 23, Taylor teaches a method, comprising: shifting data within a plurality of processing elements; and each active processing element selecting data as a final output in accordance with the formula f (d(0), d(1), d(2) . . . d(n-1)) where f is dependent upon the desired output. *The examiner asserts that the shifts outlined in Fig. 7a and 7b constitute data being shifted within a plurality of processing elements. The examiner further asserts that data is stored in response to the desired output: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift, dependent on their location in the shift scheme.*

21. As per claim 24, Taylor teaches the method of claim 23 additionally comprising one of loading an initial count into each processing element and calculating an initial count locally based on the processing element's location and the function f. *The examiner asserts that a count must inherently be maintained to execute the shift loop a predetermined number of times. If a count were not maintained, there would be no way to ensure the proper number of data shifts.*

22. As per claim 25, Taylor teaches the method of claim 24 additionally comprising maintaining a current count in each processing element, said current count being responsive to said initial count and the number of data shifts performed, said selecting being responsive to said current count. *The examiner asserts that in order to maintain a count, it must inherently be set to an initial value. Further, the examiner asserts that updating said count is inherent, as a count is useless unless it is updated on each*

iteration of the function it is counting. Data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.

23. As per claim 26, Taylor teaches a memory device carrying a set of instructions which, when executed, perform a method comprising: maintaining a count in at least certain of said processing elements, each count being responsive to a processing element's location; and for each processing element maintaining a count; storing data in response to its count. *The examiner asserts that the array controller 14 constitutes a processing element, as it controls processing in the array. Array controller 14 inherently maintains a count to ensure that the proper number of shifts take place to achieve the desired results. For instance, for the array to accomplish the data reflection (col. 9-10) the controller must issue 1+n/2 shift instructions (col. 10 line 18). The examiner further asserts that data is stored in response the count: when the final shift has occurred (as detected by the count) the array elements retain the data of the final shift.*

Claim Rejections - 35 USC § 103

24. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

25. Claims 3, 4, 12-14, and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Taylor.

26. As per claim 3, Taylor teaches the method of claim 1 but fails to disclose wherein said maintaining a count includes setting a counter to an initial value, and counting down from said initial value, said storing occurring when a current count is non-positive.

27. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

28. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

29. As per claim 4, Taylor teaches the method of claim 1 but fails to teach wherein said maintaining a count includes setting a counter to a first known value, and counting up from said first known value, said storing occurring when a current count equals a target count.

30. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

31. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

32. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored value required by the NEWS setting to ensure the proper number of shifts was performed.

33. As per claim 12, Taylor teaches the method of claim 11 but fails to disclose wherein said modification includes one of incrementing and decrementing said initial count.

34. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

35. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

36. As per claim 13, Taylor teaches the method of claim 12 wherein said selecting occurs when said current count is non-positive. *The examiner asserts that zero is a non-positive value.*

37. As per claim 14, Taylor teaches the method of claim 12 wherein said selecting occurs when said current count equals a target value. *The examiner asserts that zero constitutes a target value.*

38. As per claim 17, Taylor teaches the method of claim 16 but fails to teach wherein said current count is incremented in response to said data shifts and said selecting occurs when a target value is reached.

39. Official Notice is taken that incrementing a counter and comparing it to a stored comparison value is well known in the art.

40. Incrementing a local count provides a simple implementation to ensure a function is performed a correct number of times, ensuring proper operation of the processor.

41. It would have been obvious to one of ordinary skill in the art at the time of invention to have incremented a count in Taylor's processor until it matched a stored

value required by the NEWS setting to ensure the proper number of shifts was performed.

42. As per claim 18, Taylor teaches the method of claim 16 wherein said current count is decremented from an initial count and said selecting occurs when said current count reaches a non-positive value.

43. Official Notice is taken that counting down from an initial value is well known in the art. Counting down from an initial value to zero to determine the number of iterations of a loop provides the benefit of not having to store a comparison value separate from zero. Without having to store the additional value, less hardware is necessary.

44. It would have been obvious to one of ordinary skill in the art at the time of invention to have implemented the loop count of the array controller by decrementing from an initial value to zero for the benefit of not having to store a comparison value with additional logic.

Response to Arguments

1. Applicant's arguments filed 3 November 2006 have been fully considered but they are not persuasive.

2. Applicant states:

"It is thus clear from the plain language of the claim that the processing element that is storing data is the processing element that is maintaining a count. However, to make it abundantly clear, claim 1 has been amended to recite 'selecting data, in each processing element maintaining a count, for output in response to that processing element's count."

Examiner disagrees. The amendment does not make this point any more clear. In fact, as amended, the claim appears to state that selecting occurs in the processing element maintaining a count—not the storing. Claim 1 doesn't even use the word "storing". Aside from creating a problem under 35 USC 101, this amendment certainly fails to make Applicant's point "abundantly clear".

3. Applicant states:

"[Regarding claim 1, W]here in Tyler is there a plurality of processing elements each maintaining a count?"

Examiner asserts that this limitation does not appear to be required by claim 1. "At least certain of said processing elements" does not require a plurality.

4. Applicant states:

"[Regaring claim 1,] Where, in Tyler, is there a disclosure of selecting data in each of the processing elements marinating a count for output in response to that processing element's count?"

The control of Tyler does the selecting for the algorithm of the data transfer. This selecting is based on the count shown in col. 10. The claim simply appears to require that the selecting occur in the "each processing element maintaining a count"; regarding the current rejection, this processing element is anticipated by the control. This limitation is very clearly satisfied.

Conclusion

45. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bratt et al. (U.S. Patent No. 6,877,020) disclose a matrix of processing elements performing various shift operations on the data in said elements.

Crozier (U.S. Patent No. 5,081,700) discloses a system for rotating an image by means of shifting data in an array.

The following is text cited from 37 CFR 1.111(c): In amending in reply to a rejection of claims in an application or patent under reexamination, the applicant or patent owner must clearly point out the patentable novelty which he or she thinks the claims present in view of the state of the art disclosed by the references cited or the objections made. The applicant or patent owner must also show how the amendments avoid such references or objections.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian P Johnson whose telephone number is (571) 272-2678. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Chan can be reached on (571) 272-4174. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).